

Prevalence of sexually transmitted pathogens among women attending a methadone clinic in Israel

Z Samra, M Dan, S Segev, Y Fintsi, S Bar-Shany, M Weinberg, R Gutman

Abstract

Objective—To assess the prevalence of sexually transmitted pathogens in drug-addicted women in Tel Aviv, Israel.

Design—A prospective study conducted between March and July 1987.

Setting—A methadone clinic in Tel Aviv, Israel.

Subjects—Sixty four asymptomatic female drug addicts were studied; 38 of them were declared practising prostitutes.

Methods—Cervical specimens were obtained for cultures, and blood samples were drawn for serological tests. Demographic data and sexual histories were obtained using a standard questionnaire.

Results—*Chlamydia trachomatis* was detected in the cervix of 25% of women; 98% had antibody titres ($> 1:64$). *Mycoplasma hominis* and *Ureaplasma urealyticum* were isolated in 57% and 65% respectively. *Gardnerella vaginalis* was detected in 17% of women, and herpes simplex virus was cultured from two prostitutes. Five per cent of women were carriers of HB_sAg, while 57% had HB_s and/or HB_c antibodies. Only one prostitute had specific treponemal antibodies. In no case were gonococci or group B streptococci isolated, and HIV serology was invariably negative.

Conclusion—Chlamydia and genital mycoplasmas appear to be the prevailing pathogens in Israeli drug-addicted women, while gonococci and *Treponema pallidum* occur only rarely.

Introduction

The impact of prostitution and other forms of sexual promiscuity on the spread of sexually transmitted diseases has been known for decades.^{1,2} This has been well studied in regard to transmission of syphilis and gonorrhoea.³⁻⁶ In recent years a variety of new sexually transmitted pathogens have been added to the list of venereal diseases.⁷ Data on the prevalence of these new agents among sexually promiscuous women are scarce and incomplete. Only after levels and extents of infection have been firmly established, can a meaningful approach to each disease be carefully developed and systematically implemented. Indeed, the recent WHO guidelines for the control of sexually transmitted diseases (STD)⁸ specifies female prostitutes among the priority groups to which screening and control activities should be directed.

This study was designed to assess the prevalence of various sexually transmitted pathogens in drug-addicted women (most of whom practised prostitution) in Tel Aviv, Israel.

Subjects and methods

Population studied

Women attending a methadone clinic in Tel Aviv from March to July 1987, were candidates for inclusion in the study. Of 200 subjects approached, 64 agreed to participate in the survey. None had evidence of ongoing STD. Demographic data and sexual histories were obtained from the women using a standard questionnaire. Cervical specimens were taken and blood samples were drawn.

The population in question is known to be particularly distrustful and wary when confronted by authoritarian figures. The additional discomfort of gynaecological examinations and venipuncture also precluded a larger sample size.

Microbiological procedures

Isolation of *N gonorrhoeae*: material from the endocervix was collected in modified Stuarts transport medium⁹ transferred within one hour to the laboratory where it was inoculated onto plates containing Thayer Martin medium. Isolates were confirmed as *N gonorrhoeae* by carbohydrate utilisation tests.

The Beilinson Medical Center, Petah Tikva
Z Samra
The E Wolfson Hospital, Holon
M Dan, Y Fintsi, R Gutman
The Sheba Medical Center, Tel Hashomer
S Segev
Central Blood Services, Tel Hashomer
S Bar-Shany
Tel Aviv Medical Center, Tel Aviv, Israel
M Weinberg

Isolation of *Chlamydia trachomatis*: Endocervical specimens obtained with calcium alginate swab were placed into vials containing 0.2 M sucrose in a 0.02 M phosphate buffer with 10 µg/ml of gentamicin and 1 µg/ml of amphotericin B (Chlamydia Transwab, Medical Wire & Equipment Co., Corsham, Wilts, UK). The specimens were frozen at -70° until cultured. Specimens were inoculated on cycloheximide-treated McCoy cells. *Chlamydia* inclusion bodies were detected by iodine staining after 48 and 72 hours of incubation. *Chlamydia* serology was performed using an indirect immunoperoxidase assay (Ipazyme Chlamydia, Savyon Diagnostics, Beersheva, Israel).

Isolation of *Mycoplasma hominis* and *Ureaplasma urealyticum*: Material from the endocervix was collected in modified Stuarts transport medium. Cultures were performed on A3 or A7 Medium (broth and agar).

Isolation of *Gardnerella vaginalis*: High vaginal swabs were plated on Cosman agar (Difco) with 5% human blood and containing gentamicin 4 µg/ml, nalidixic acid 30 µg/ml and amphotericin B 2 µg/ml as selective agents.

Isolation of group B *Streptococcus*: Material from the endocervix was collected in modified Stuarts transport medium. In the laboratory it was inoculated on sheep blood agar plates. Grouping of streptococcal isolates was done by the Lancefield method.

Isolation of herpes simplex virus (HSV): Material from the exo- and endocervix was collected in viral transport medium tubes (Virocult, Medical Wire & Equipment Co, Corsham, Wilts, UK) which were held in -70° until processed. A mixture of viral transport medium and an antibiotic solution (0.2 ml) was inoculated into fore-skin diploid and vero-cell culture tubes. Tubes were observed daily for 10 days for the presence of typical cytopathic effect produced by HSV.

For Treponemal serology the VDRL test was used. Positive sera underwent specific testing using the TPHA test.

Antibodies to human immunodeficiency virus (HIV) were determined by an ELISA assay (Abbott Laboratories, North Chicago, IL).

Hepatitis B virus (HBV) markers were studied as follows: HBsAg by Auszyme Monoclonal, Abbott; antibodies to HBsAg (anti HBs) by Ausab Ria, Abbott; and antibodies to HBcAg (anti HBc) by Corzyme, Abbott.

Results

The mean age of the 64 women was 31.4 years, range 22-48 years. Thirty eight (60%) declared that they practised prostitution. Thirty women (47%) used drugs intravenously (21 of them were prostitutes) and 34 (53%) were non-intravenous drug users (oral and/or nasal opiate users).

Isolation and seropositivity rates of the different pathogens are shown in table 1. In four women only one organism was isolated from the cervix. Two organisms were found in 35 (54%) women. Three pathogens were isolated concomitantly from seven (11%) women.

In order to examine possible correlations between the prevalence of various pathogens and risk factors (prostitution, intravenous drug use) we divided the study population into four groups: 1. prostitution + intravenous drug use (IVDU) (20 women); 2. prostitution + non-IVDU (18 women); 3. IVDU (10 women); and 4. non-IVDU (16 women). No significant differences were observed among the groups and between prostitutes (groups 1 + 2) and non-prostitutes (groups 3 + 4) in the prevalence of sexually transmitted pathogens.

Discussion

Recent data from the USA¹⁰ and Europe¹¹ suggest that prostitutes in industrialised societies still play an important role in the spread of sexually transmitted infections. It is not surprising that in the post-penicillin era *N gonorrhoeae* and *T pallidum* are no longer the leading causes of STD. They have been replaced by penicillin-resistant pathogens and as *C trachomatis* and the genital mycoplasmas.¹⁰ This trend is also reflected in our results with isolation rates for *C trachomatis* and genital mycoplasmas well above those of other pathogens. The absence of *N gonorrhoeae* in our study is in accordance with the findings of a recent survey performed among young

Table 1 Prevalence of sexually transmitted micro-organisms among 64 drug-addicted women

Micro-organisms	No of women tested	No of positive results	Prevalence rate, %
<i>C trachomatis</i>			
Culture	61	15	25
Serology*	62	61	98
<i>U urealyticum</i>	58	38	65
<i>M hominis</i>	58	33	57
<i>N gonorrhoeae</i>	51	0	0
Group B <i>Streptococcus</i>	64	0	0
<i>G vaginalis</i>	64	11	17
Herpes simplex	64	2	3
Hepatitis B virus			
HBsAg	62	3	5
Anti-HBs and/or anti-HBc	63	36	57
<i>T pallidum</i>			
VDRL	64	2	3
TPHA	64	1	1.5
HIV antibodies	64	0	0

*IgG ≥ 1:64.

sexually active Israeli women. *N gonorrhoeae* was isolated in only one case out of 306 symptomatic individuals (0.3%), and in none of 80 asymptomatic women.¹² On the other hand, a study from the early seventies among 61 promiscuous teen-aged girls revealed that 11% harboured the organism.¹³ Data from the Israeli Ministry of Health¹⁴ show that the annual incidence of gonorrhoea in the civilian population has declined since 1970 (annual rate, 40/100,000). In 1982, a further decline was noted which accelerated considerably in 1986 and 1987 with an annual rate of 5/100,000.

The fact that no group B *Streptococcus* was isolated from the participants of the study strengthens previous conclusions that this organism is of uncommon occurrence in Israeli women, and is a less prevalent pathogen in neonates than in the USA and Europe.¹⁵ We could not demonstrate a significant difference in the occurrence of various STD agents between prostitutes and drug abusing women who denied prostitution. This lack of difference can be explained by a high degree of promiscuity in the latter group, or under-reporting of prostitution in this group.

Most studies on the prevalence of sexually transmitted pathogens in prostitutes have been performed in STD clinics, and may therefore not represent the true patterns of prevalence because of the inherent biases associated with self-referred cases recorded by such clinics. On only a few occasions were similar surveys performed in other environments, and usually only a restricted number of pathogens were screened. We used the data from such publications which have appeared in the 1980s for comparison with our results (table 2).

Donovan¹⁶ has screened 70 prostitutes (mean age, 22.2 years) at a massage parlour in Sydney, Australia, for gonorrhoea and syphilis. Thirteen percent of the women had gonorrhoea detected at the first screening, and 10% acquired new infections each week. Four women had positive non-specific treponemal serology but negative specific serology; these were all IVDUs.

Nayyar *et al*¹⁰ have studied the prevalence of a wide range of genital micro-organisms in 300 prostitutes (mean age 27.3 years) in New York City brothels. Although they have found a higher rate of *N gonorrhoeae* in their population, the occurrence of *C trachomatis*, *M hominis* and *U urealyticum* was almost identical to that in our group of promiscuous women.

Ruijs *et al*¹⁷ have studied 24 prostitutes (mean age, 29.9 years) working in brothels in Groningen, The Netherlands. Four (16%) harboured *C trachomatis* and two (8%) carried *N gonorrhoeae*.

High prevalence (16/33) of treponemal serological markers (VDAL, TPHA) was noted in Tunisian prostitutes.¹⁸ At least part of that may be due to non-venereal treponemal infections. The occurrence of HBsAg (6%) and antibodies to hepatitis B virus (70%) was similar to that in our study.

Interestingly, the prevalence of HBsAg (6%) and anti-HB antibodies (64%) in prostitutes in Singapore¹⁹ was not different from that observed in their counterparts from the Mediterranean region¹⁶ (and our study). In Taiwan,²⁰ on the other hand, the HBsAg carrier rate (19.6%) among prostitutes (mean age, 29.3 years) was high, but only slightly higher than that in the local general population.

We conclude that *C trachomatis* and the genital

Table 2 Comparison of the prevalence of sexually transmitted micro-organisms in promiscuous women in different countries

Micro-organism	Prevalence rate (Author, ref Country)						
	Samra* Israel	Donovan ¹⁶ Australia	Bchir ¹⁸ Tunisia	Nayyar ¹⁰ USA	Ruijs ¹⁷ Netherlands	Goh ¹⁹ Singapore	Chen ²⁰ Taiwan
<i>C trachomatis</i>							
Culture	25%			25.3%	16%		
Serology	98%						
<i>U urealyticum</i>	65%			73.0%			
<i>M hominis</i>	57%			57.3%			
<i>N gonorrhoeae</i>	0	13%		9.3%	8%		
<i>T pallidum</i>							
VDRL	3%	6%					
TPHA	1.5%	0	48%				
HBV							
HBsAg	5%		6%			6%	19.6%
Anti-HB	57%		70%			64%	
HIV antibodies	0		0				0

*Present study.

mycoplasmas appear to be the prevalent sexually transmitted pathogens in Israeli promiscuous women as in other parts of the world¹⁰ while *N gonorrhoeae* and *Treponema pallidum* are markedly less common. The absence of *N gonorrhoeae* and HIV infection in our study population correlates well with the sharply declining incidence of the former¹⁴ and the low prevalence of the latter²¹ in Israel.

Address for correspondence: Dr M Dan, Infectious Diseases Unit, The E. Wolfson Hospital, Holon 58100, Israel.

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